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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/828,389	04/19/2004	Douglas Sabin	K2001-700210	4832

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EXAMINER	
SAINT SURIN, JACQUES M	
ART UNIT	**PAPER NUMBER**
2856	

DATE MAILED: 09/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/828,389	SABIN ET AL.	
	Examiner	Art Unit	
	Jacques M. Saint-Surin	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08/26/04, 04/19/04*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31* is/are rejected.

7)☒ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 30-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

2. Claim 30 recites the limitation " the first summation curve " in line 10. There is insufficient antecedent basis for this limitation in the claim.

Claim 31 recites the limitation "the second summation curve" in line 5. There is insufficient antecedent basis for this limitation in the claim

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-18, 21-22, 24-26 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wertz et al. (US Patent 5,167,157) in view of Sapia et al. (US Patent 5,513,531).

Regarding claims 1 and 9, Wertz discloses a system (apparatus and method for inspecting multilayer articles) to facilitate measurement, comprising:

an article mount (holding device 16) adapted to maintain an article (18) comprising a plurality of layers (110) including an outer skin layer (col. 8, line 60) an inner skin layer (col. 8, line 56), a core layer (central barrier layer, col. 8, line 64) an inner skin layer (col. 8, line 57) wave energy reflected from the article and adapted to generate an electronic signal (104) corresponding to the portion of the wave energy; and a processor (82) electronically coupled to the transducer (60) adapted to process the electronic signal to identify a characteristic shape corresponding to an interface(108) between two of said plurality of layers (110);

a processor (82) electronically coupled to the transducer (60) adapted to process the electronic signal to identify a characteristic shape corresponding to an interface between two of said plurality of layers (as shown in part in FIG. 5, a portion of each pulse 104 is reflected from the surfaces 106 and each interface 108 between layers 110 in the sheet 18 back to the transmitting transducer, where the received reflections are converted to electrical signals and sent to the computer 82 via the pulser/receiver 100. The electrical signals can then be analyzed in accordance with known techniques to provide layer thicknesses from the perspective of each transducer as far into the sheet 18 as each pulse is able to penetrate and provide a sufficient reflection, see: col.

8, lines 33-43. However, Wertz does not disclose or suggest to determine parameters of a killing function. Note that the killing function is defined as any function used to remove or substantially reduce a portion of a selected signal shape representing a single interface component from the signal. Sapia discloses an adaptive least-mean square (LMS) implementation of a Wiener filter is used to deconvolve the ultrasonic waveforms in order to obtain approximate, but realizable, impulse signals for each separate backscattered event, see: col. 3, lines 31-35. It would have been obvious to one having ordinary skill in the art at the time of the invention to utilize in the processor Wertz the techniques of Sapia because by incorporating software into the measuring system, it is possible to not only deconvolve the waveform, but also to automatically identify signal peaks and measure both wall and layer thickness. Therefore, the above combination would provide unambiguous, reliable and accurate measurements of thin layers.

Regarding claim 9, it is similar in scope with claim 1 and therefore is rejected for reasons set forth for that claim.

Regarding claims 2, 16-18 and 20, Wertz does not specifically disclose the characteristic shape harmonic and a first peak and corresponds to the first interface, Sapia discloses it is possible to use the system to perform measurements based on 1st peak, maximum amplitude or 1st data point exceeding threshold (see: col. 12, lines 64-66). Regarding claims 17-20 and 23, Wertz does not disclose the characteristic shape is a peak, determining major peaks and identifying a peak corresponding to the interface from among the major peaks. Sapia discloses once a peak signal is obtained,

the CPU is used to calculate Wiener coefficients, which then may be conveniently stored as a binary file, for example. The filtered (deconvolved) waveform is processed through a calibrated reference gate (R-gate) to identify the peak associated with the base material's backwall. This peak is used to accurately measure the base material wall thickness. In this way, the digital filter deconvolves the single event. Once calibration has taken place, a sample, e.g. a vessel wall 158 or a tube wall 160, as in FIG. 5B, may be measured. The transducer 150 is placed on the test component and a thickness is calculated by the CPU 132 according to the programmed algorithm. Accordingly, the filtered waveform is further processed by a measurement gate (M-gate) used to determine the oxide or coating thickness. The peak found by the R-gate defines the beginning of the M-gate. Thus, the M-gate is floating and is determined dynamically by where a signal occurs in the R-gate. Typically, the maximum peak occurring in the M-gate identifies the thin layer backwall. Since the thin layer is typically a different material than the base, the appropriate velocity is applied to determine its thickness, see: col. 11, lines 45-67. It would have been obvious to having ordinary skill in the art at the time of the invention to utilize in Wertz the techniques of Sapia because it would provide the operator the ability to quickly determine if the software has correctly identified the peaks and thereby determine whether to record it as a valid measurement.

Regarding claims 3 and 10, Wertz discloses a carrier 20 is movably mounted on the unit 10 relative to the tank 12 such that the carrier 20 can traverse the length of the tank and thus the entire article 18, see: col. 5, lines 47-49.

Regarding claims 4 and 11, Wertz discloses wave energy source as transducer 60.

Regarding claims 5 and 12 Wertz discloses the apparatus may further comprise a tank 12 for holding the liquid 14and a liquid acoustic transmission medium, wherein the holding device 16 holds the object in the acoustic transmission medium, see: col. 3, lines 43-47.

Regarding claims 6-7 and 13-14, Wertz discloses a plurality of transducers 60 and 62.

Regarding claims 8 and 15, Wertz discloses the focused pulse 104 from each transducer enters the plastic sheet (col. 8, lines 31-32).

Regarding claims 21-22 and 26-27, Wertz discloses an article (18) comprising a plurality of layers (110) including an outer skin layer (col. 8, line 60) an inner skin layer (col. 8, line 56), a core layer (central barrier layer, col. 8, line 64) an inner skin layer (col. 8, line 57).

Regarding claims 24-25, Wertz does not disclose the killing function is a linearly decaying sinusoid. Sapia discloses this filter applies a linear transformation to an input 10 shown as x[k]. The estimation is linear in that the estimate of the signal y[k] obtained at an output 12 of the filter is linearly related to the samples of the process applied to the input 10. It would have been obvious to one of the ordinary skill in the art to be motivated to recognize the advantages of utilizing a linearly decaying sinusoid for obtaining reliable data to perform a better and reliable inspection.

Regarding claim 26, it is similar in scope as claim 1 and therefore is rejected for the reasons set forth for that claim. Furthermore, Wertz discloses the computer 82 first calculates each thickness in accordance with standard techniques, and then calculates the mean of the two measurements for the interior layers, which is output as the calculated thickness for these layers. Further, since the total number of layers should be known, the results from the two transducers are combined so that the output or stored data includes a single measurement of the thickness of each layer, see: col. 9, lines 5-12.

Regarding claim 30, it is similar in scope with claim 29 and therefore is rejected for the reasons set for that claim. Furthermore, Wertz discloses the calculated thickness of the layers of the plastic sheet 18 can then be checked against expected values (step 214). If one or more layer thicknesses do not fall within predetermined tolerances, the operator is alerted of the situation (step 216) and/or the measurement procedure is automatically stopped. Typically, the operator would verify that the inspection sequence being carried out is appropriate for the article being inspected, and/or that the proper data has been input to the computer 82.

Allowable Subject Matter

6. Claims 19, 23 and 27-28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Claim 31 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Shihadeh (US Patent 6,494,097) discloses a method and apparatus for measuring thickness of a layer in a multi-layered object.

Beuter (US Patent 4,512,194) discloses a method and apparatus for controlling or measuring the thickness of material layers.

Oltman (US Patent 3,453,456) discloses ultrasonic transducer.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacques M. Saint-Surin whose telephone number is (571) 272-2206. The examiner can normally be reached on Mondays through Fridays 10:30 A.M. -7:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272 2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jacques M. Saint-Surin
09/03/05

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